Appl. No. 09/977,272
Amdt. dated February 15, 2005
Reply to Office Action of September 27, 2004

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1.   (currently amended) A method of streaming video data, comprising:

providing a plurality of frames to be transmitted from a video transmitter system to a video receiver system;

categorizing the plurality of frames into at least one ~~a~~ reference frame and ~~a~~ at least first and second prediction frames, the reference frame and the first prediction frame are encoded for transmission to the video receiver system, the reference frame being encoded using a zero run coding method;

~~encoding the reference frame to be transmitted to the video receiver system using a zero run coding method;~~

transmitting the encoded reference frame to the video receiver system;

dividing the second prediction frame into a plurality of blocks;

determining whether any of the plurality of blocks needs to be transmitted to reproduce the second prediction frame of acceptable quality at the video receiver system, wherein the determining step includes comparing a block of the second prediction frame with a corresponding block of a comparison frame that has been previously encoded for transmission to the video receiver system, the comparing step including obtaining a difference value D between a first value representing the block of the second prediction frame and a second value representing the corresponding block of the comparison frame; and

transmitting to the video receiver system ~~only~~ the blocks that have been determined necessary to reproduce the first prediction frame of acceptable quality at the video receiver system;

dividing the block of the second prediction frame into a first set of sub-blocks;

obtaining a first set of representative values of the first set of sub-blocks;

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dividing the corresponding block of the comparison frame into a second set of sub-blocks; and

obtaining a second set of representative values for the second set of sub-blocks, wherein the difference value D is obtained by subtracting one of the set of the representative values from the other set of the representative values.

2.   (original) The method of claim 1, further comprising:

marking the blocks of frame that have been determined as necessary to reproduce the prediction frame of acceptable quality at the video receiver system.

3.   (canceled)

4.   (currently amended) The method of claim 1 3, wherein the comparison frame is the reference frame.

5.   (currently amended) The method of claim 1 3, wherein the comparison frame is the first prediction frame.

6.   (currently amended) The method of claim 1 3, wherein the comparison frame is a frame that has been encoded for transmission immediately prior to the second prediction frame.

7-8.   (canceled)

9.   (currently amended) The method of claim 1 7, further comprising:
comparing the difference value D to a first threshold value T1; and
determining whether to transmit the block of the second prediction frame to the video receiver system according to a result of the comparing of the difference value D to the first threshold value T1.

10.   (original) The method of claim 9, wherein the block of the second prediction frame is marked for transmission to the video receiver system if the difference value D is greater than the first threshold value T1.

11.   (currently amended) A method of streaming video data, comprising:

providing a plurality of frames to be transmitted from a video transmitter system to a video receiver system;

categorizing the plurality of frames into at least one reference frame and at least first and second prediction frames,

encoding the reference for transmission to the video receiver system using a zero run coding method;

transmitting the encoded reference frame to the video receiver system;

dividing the second prediction frame into a plurality of blocks;

determining whether any of the plurality of blocks needs to be transmitted to reproduce the second prediction frame of acceptable quality at the video receiver system; and

transmitting to the video receiver system the blocks that have been determined necessary to reproduce the second prediction frame of acceptable quality at the video receiver system,

wherein the determining step includes:

comparing a block of the second prediction frame with a corresponding block of a comparison frame that has been previously encoded for transmission to the video receiver system in order to obtain a difference value D between a first value representing the block of the second prediction frame and a second value representing the corresponding block of the comparison frame,

comparing the difference value D to a first threshold value T1;

determining whether to transmit the block of the second prediction frame to the video receiver system according to a result of the comparing of the difference value D to the first threshold value T1;

~~The method of claim 9, further comprising:~~

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comparing the difference value D to a second threshold value T2; and

determining whether to transmit a first set of blocks in close proximity to the block of the second prediction frame according to a result of the comparing the difference value D to the second threshold value.

12.   (currently amended) The method of claim 11, further comprising:

comparing the difference value D to a third threshold value T3; and

determining whether to transmit a second set of blocks in close proximity to the block of the second prediction frame according to a result of the comparing the difference value D to the third threshold value, wherein the comparison frame is the reference frame or the first prediction frame.

13.   (original) The method of claim 12, wherein the first set of blocks are adjacent blocks to the block of the second prediction frame.

14.   (original) The method of claim 12, wherein the second set of blocks are diagonal blocks to the block of the second prediction frame.

15.   (original) The method of claim 12, wherein the first, second and third threshold values T1, T2, and T3 have the following relationship: T1<T2<T3.

16.   (currently amended) The method of claim 1 3, wherein the plurality of frame to be transmitted are categorized into only two types of frames.

17.   (canceled)

18.   (currently amended) A method of streaming video data, comprising:

providing a plurality of frames to be transmitted from a video transmitter system to a video receiver system;

categorizing the plurality of frames into a plurality of reference frames and a plurality of prediction frames;

encoding the plurality of the reference frames using a first encoding method; and

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encoding the plurality of the prediction frames using a second encoding method different from the first encoding method, the second encoding method including:

dividing a first prediction frame into a plurality of blocks;

determining, ~~using a diff function method,~~ whether any of the plurality of blocks of the first prediction frame needs to be transmitted to reproduce the first prediction frame of acceptable quality at the video receiver system; and

transmitting to the video receiver system ~~only~~ the blocks of the first prediction frame that have been determined necessary to reproduce the first prediction frame of acceptable quality at the video receiver system,

<u>wherein the determining step includes:</u>

<u>comparing a block of the first prediction frame with a corresponding block of a comparison frame to obtain a difference value D;</u>

<u>comparing the difference value D with a first threshold value T1;</u>

<u>indicating the block of the first prediction frame as needing to be transmitted to the video receiver system if the difference value D is greater than the first threshold value T1;</u>

<u>comparing the difference value D to a second threshold value T2; and</u>

<u>indicating a first set of blocks in close proximity to the block of the first prediction frame as needing to be transmitted to the video receiver system if the difference value D is greater than the second threshold value T2.</u>

19-20.   (canceled)

21.   (currently amended) The method of claim <u>18</u> ~~20~~, further comprising:

comparing the difference value D to a third threshold value T3; and

indicating a second set of blocks in close proximity to the block of the first prediction frame as needing to be transmitted to the video receiver system if the difference value D is greater than the third threshold value T2.

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22. (currently amended) The method of claim 18 ~~19~~, wherein the comparison frame is a frame that immediately precedes the first prediction frame in the order of transmission to the video receiver system.

23. (original) The method of claim 22, wherein the comparison frame is a second prediction frame.

24. (currently amended) The method of claim 18 ~~19~~, wherein the comparison frame is a reference frame.

25. (new) A method of streaming video data, comprising:

providing a plurality of frames to be transmitted from a video transmitter system to a video receiver system;

categorizing the plurality of frames into at least one reference frame and at least first and second prediction frames;

encoding the reference frame to be transmitted to the video receiver system using a zero run coding method;

transmitting the encoded reference frame to the video receiver system;

dividing the second prediction frame into a plurality of blocks;

determining whether any of the plurality of blocks needs to be transmitted to reproduce the second prediction frame of acceptable quality at the video receiver system;

transmitting to the video receiver system the blocks that have been determined necessary to reproduce the second prediction frame of acceptable quality at the video receiver system;

wherein the determining step includes:

comparing a block of the second prediction frame with a corresponding block of a comparison frame that has been previously encoded for transmission to the video receiver system in order to obtain a difference value D between a first value representing the block of the second prediction frame and a second value representing the corresponding block of the comparison frame;

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comparing the difference value D to a second threshold value T2; and

determining whether to transmit a first set of blocks in close proximity to the block of the second prediction frame according to a result of the comparing the difference value D to the second threshold value.

26.   (new) The method of claim 25, wherein the determining step further comprises:

comparing the difference value D to a first threshold value T1; and

determining whether to transmit the block of the second prediction frame to the video receiver system according to a result of the comparing of the difference value D to the first threshold value T1.